



A LITERATURE REVIEW OF THE EFFECTS OF EMOTIONAL VALENCE AND AROUSAL ON MEMORY, WITH A FOCUS ON THE RECOLLECTION OF EMOTIONAL EVENTS

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ABSTRACT

How does the valence and arousal of emotions affect the accuracy and recall of emotional events? Emotional valence and arousal are two major components of emotions that affect how the emotions affect the memory of an individual. Research has shown that memories that are emotionally intense and significant to the individual change what information is remembered and recalled easier, depending on the valence and arousal level. The vividness of emotionally intense memories is often better than neutral events, but the accuracy of recall of emotional events are often more inaccurate and inconsistent compared to neutral events.

KEYWORDS: Color, emotional valence, arousal, retention.

INTRODUCTION

Research on emotion and memory has almost always focused on the question of whether emotion enhances memory and how recall for emotional events can be affected. Based on research, investigators have found that emotion enhances memory retrieval and recall, and emotional events are better recalled than non-emotional events. Memories of emotional events can differ in vividness and accuracy during recall, which can be affected by emotional valence and arousal - two major components of emotions that are associated with memories. The diverse emotional valence types and varying levels of arousal associated with emotional memories can strongly impact the recall of emotional events and the accuracy of that recall.

A Literature Review

Effects of Emotional Valence and Arousal on Memory

Emotional Valence describes the level of pleasantness one feels when a stimulant is encoded, which can range from strongly negative to neutral to strongly positive. For example, emotions associated with sadness have a negative emotional valence while emotions associated with happiness have a positive emotional valence. Arousal is defined as the level of activation or the intensity of the stimulus that is encoded which varies from low to high on a score rating of 1 (calm) to 9 (excited), as per the Affective Norms for English Words (ANEW). Research on the effects of arousal has shown that highly arousing events are more memorable and able to be recalled easier than for less arousing events.

In a study done by Bradley et al. (1992), participants were asked to recall 60 pictures that they had rated a year earlier according to emotional valence and arousal. When testing for pictures rated in arousal, the participants recalled the pictures rated as highly arousing much easier than low arousal events. The pictures high in arousal were also easier to recall over an extended period (1 year) than those with strong emotional valence. On the other hand, recall of events with emotional valence that is either more strongly positive or negative is better than for neutral events. The second part of the 1992 study tested the recall of pictures rated as negative or positive in emotional valence. They found that the recall of more positively or negatively valenced events was better than recall of pictures rated as neutral, but overall, the pictures were hard to remember. This study shows that both arousal and emotional valence associated with events seem to improve memory for the recall of visual events; however, long-term memory of emotional events is most affected by elevated levels of arousal.

The effects of positive and negative valence on memory have been the focus of research since the 1920s, mostly based upon the Freudian theory that negatively valenced information would be less remembered than positively valenced information. To test the theory, Thomson (1930) investigated long-term retention of self-generated positive or negative words from participants. Participants were asked to write 20 positive and 20 negative words. One month later, they were asked to recall as many of the words generated as possible. Recall of positive words (38%) was higher than recall for negative words (24%). This study proved that positive events are better remembered than negative events, but the investigation did not explain why this is the case.

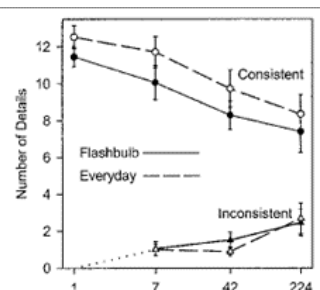
In studies where emotional valence and arousal have been factorially manipulated (controlled by experimenters), the two components have often been found to interact. For instance, in a study done by Jeffries et al. (2008) observing valence and arousal interacting in attentional control, emotional valence and arousal of participants were manipulated to generate calm, happy, sad, and anx-

ious moods. Results for an attentional blink task showed strong differences in accuracy of picture changes between participants with different moods. Participants with moods of negative valence had the highest accuracy for low arousal and lowest accuracy for strong arousal. Accuracy was intermediate for those with moods of positive valence, regardless of their arousal level.

Memory Accuracy of the Recall of Emotional Events

An argument provided by Brown & Kulik (1977) in their article on flashbulb memories (vivid, emotionally intense memories) showed that there may be some mechanism in the brain that leads to remembering emotional events with close to photographic accuracy, due to the survival value of this mechanism for human ancestors. When participants were asked to describe how they first learned about highly emotional events, they were typically able to supply a detailed report on where they were, what was happening at the time, who told them the news, and how they felt. Those emotional memories often had vivid and specific details that seemed to endure for a long time. Although the memories recalled in that experiment were described and visualized clearly, other researchers have claimed that vividness and detail of emotional memory recall does not imply accuracy.

Several experiments have implicated negative valence in reduced memory accuracy of past emotional events. Some research shows evidence that negative valence tends to lead to more false memories compared to neutral or positive valence. Moreover, negative valence has been found to increase reports of confidence and vividness in recall of events without increasing memory accuracy. A study done by Talarico & Rubin (2003) found that vividness in recall of the terrorist attack events of September 11, 2001, were higher than for everyday events. They found that the flashbulb memories of 9/11 were associated with greater memory confidence and vividness than for everyday events, but the consistency and accuracy of these intense emotional events declined over time at a similar rate to that of everyday events.



Moreover, Brainerd et al (2010) researched the effects of arousal on these false memories generated by negative valence. They concluded that the tendency for negative valence to increase the number of false memories was greater for memories with high arousal compared to those with low arousal. In contrast, other studies have shown that greater emotional intensity is associated with greater memory consistency. Conway et al (1994) assessed memories of people upon learning of the resignation of the British Prime Minister, Margaret Thatcher. British citizens who were more emotional about the resignation than non-citizens showed greater consistency over time in their memories. Thus, although some studies have shown that greater emotional intensity of memories is associated with greater memory consistency over time, all studies have shown the memories for emotional events are far from perfect when it comes to accuracy.

Based on the above findings, memories of emotional events have been shown to often be inconsistent and inaccurate. Similarly, the accuracy of the actual emotions during recall of emotional events has been shown to be inaccurate as well. Levine (1997) studied memory for emotions in supporters of Ross Perot, a former US presidential candidate, following his sudden withdrawal from the presidential race. The event was surprising, associated with intense emotion, and viewed by the individuals as being personally and socially important. The supporters were asked to describe their first emotional reactions after Perot's withdrawal in July 1992 then asked again after the presidential election that November. Between the two periods, the views of many supporters of Perot had changed dramatically after Perot re-entered the presidential race in October and received around a fifth of the popular vote. On assessment, supporters recalled their past emotions during July as being more consistent with their appraisals of Perot in November than they actually were. For example, those who favored Perot after his re-entry underestimated how upset they had felt when he first withdrew from the race, but overestimated their first feelings of hope that Perot would re-enter.

Conclusion

To summarize, researchers of the effects of emotions on memory have studied the effects of emotional valence, describing the pleasantness of emotions, and arousal, describing the intensity of emotions, on the accuracy of emotional event recall. Studies have shown that emotional memories with a positive valence or high arousal level are easier to remember and recall than those with a negative valence or low arousal level. The vividness of emotionally intense memories, otherwise known as flashbulb memories, is much higher than that of emotionally neutral events, but the accuracy of emotional event recall is often inaccurate and inconsistent. Research on the effects of emotions on memory continues to be the center of emotion research, but perhaps another promising research direction could be to examine how information of emotionally intense events are remembered in certain emotional states.

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